

Also I find within the active leucocytes not only the spores but what appears very much like tuberculous nodules.¹ Using this theory as an hypothesis to base our observations on, and knowing that where the vitality is low from autotoxemia, that the leucocytes are in a degree inactive, something must happen on account of the multiplication of the spores. If the spores do become inactive after their cycle of activity has closed, what becomes of them? Has anyone as yet discovered an answer to this question? May it not be possible that they do become tuberculous matter? And by its accumulation in the blood may find lodgment in the finer blood vessels or lymphatic ganglions? May not this condition in time produce tuberculosis? I have found it often in the blood of pyorrhea patients; I find also that such patients are people who worry a great deal, and have the emotions very much accentuated. I find that by keeping the bowels moving twice daily for some time, thus clearing the blood-stream of toxins, that the leucocytes become active, that both the spores and tuberculosis matter, in degree, disappear. So I take it from the above basis that, if people let their minds run riot with their feelings, they will cause thereby constipation, autotoxemia, inhibition of the function of the leucocytes. This will allow the tuberculous matter to increase, and such people must, sooner or later, suffer for their own carelessness of mental action."

"The dentist who will provide himself with a first-class, high-power microscope, and learn how to use it in fresh blood analysis, in order to obtain the opsonic index of the blood will marvel that he did not do it sooner."

"The microscope also shows the stage anemia; the vital energy is shown by the shape and quality of red cells, whether they have energy enough to stand out singly and move about freely in the currents of the plasm, or whether they are deficient in quantity, and lean against each other for support in bunches of rows, like rows of coin, having little or no motion."

" . . . in the case of syphilitic spores, these can be seen within the leucocytes rushing from side to side vainly trying to find a way out. . . ."

"I will be very brief, Mr. President. I want to congratulate this society on having a man with such marked ability. I have enjoyed this paper as nothing I have heard in years, and I hope we can have this published, if possible, in pamphlet form, so we can put it in our pockets and carry it back and forth on the cars, in order that we may become thoroughly familiar with it. I should like to read it five or six times, and then I would begin to think about it."

"While sitting back here, I thought of this paper as one that should be read before the National Dental Association. We are to be congratulated upon having such a man as Dr. A. in our association."

R. B.

ORIGINAL ARTICLES

HYPERCHLORHYDRIA.*

By WILLIAM FITCH CHENEY, M. D., San Francisco.

This paper is based upon the observation of 318 cases in which hyperchlorhydria existed, as proved by stomach analysis. These were seen partly in the dispensary service at Cooper Medical College, between January 1, 1900, and January 1, 1909; and partly in private practice, between April 18, 1906, and January 1, 1910. The records of all these cases have been reviewed in the preparation of this paper.

Definition. By hyperchlorhydria is meant that condition in which the stomach contents show an abnormally high percentage of hydrochloric acid. But it has been proved by the experiments of Bickel¹ that with the hyperacidity there occurs also a hypersecretion—that the change in the juice is one not only of quality but also of quantity. Ordinarily this hypersecretion takes place only so long as food is present in the stomach and ceases as the stomach is emptied. It is only in certain rare cases originally described by Reichman, that continuous hypersecretion occurs, which goes on even during the intervals of digestion in the fasting stomach. With such cases the term hyperchlorhydria as commonly used has nothing to do. Furthermore, there is no object in attempting to distinguish between hypersecretion and hyperacidity in ordinary cases, and in this paper the two are understood to co-exist when hyperchlorhydria is mentioned.²

Recognition. The evidences of hyperchlorhydria are both subjective and objective. The *subjective* signs are quite characteristic. The patient has an excellent appetite or even an abnormal craving for food. The taking of a meal satisfies this and gives comfort for a time, but at a varying interval afterwards, averaging about two hours, distress begins. This distress is usually described as a burning feeling over the stomach or higher up in the chest, popularly known as "heart burn." There is no actual pain in simple hyperchlorhydria, though the stomach region usually feels tender and sore, and pressure even of the clothing may be uncomfortable. Accompanying this burning distress there is belching of gas; eructations occur of mouthfuls of sour fluid—the symptoms known as "water-brash"; nausea is frequent and at the height of the distress vomiting not uncommonly takes place, the vomitus being very sour, acrid and irritating. This vomiting relieves the situation until food is taken again. If vomiting does not occur, the suffering usually persists until the next meal, which removes the symptoms temporarily; but after an hour or two they all recur, and so the cycle goes on. With the constant repetition of these discomforts the patient naturally grows very irritable, peevish and disagreeable in temper. The bowels are usually obstinately constipated. There is no loss of weight of any consequence, unless the patient abstains from food be-

* Read at the Fortieth Annual Meeting of the State Society, Sacramento, April, 1910.

¹ Deutsche Med. Wochenschrift, Nov. 30, 1907, S. 1201.

² In a recent monograph on "Dyspepsia" by Fenwick, he expresses the view that hyperchlorhydria at first occurs without hypersecretion; but if long continued, hypersecretion results, at first only at the time of digestion, ultimately even during the intervals of digestion.

cause of the fear of suffering after eating, or unless he habitually induces vomiting to relieve his distress.

The *objective* signs on physical examination are tenderness over the epigastrium, but general rather than localized; a succussion splash quite constantly even for four or five hours after food has been taken; but no tender spot, no palpable tumor and no peristaltic wave over the stomach area. The only positive proof of the condition, however, is that obtained by the test meal. One hour after the Ewald meal is taken, the material removed is usually abundant, it often comes out through the tube with a violent gush and it contains a larger proportion of fluid than of solids, making an excess of liquid in the receiving vessel, with well-triturated toast settling to the bottom. This is the characteristic finding in hyperchlorhydria and by it one learns to feel reasonably certain of the diagnosis even before the analysis is made. The total acidity is high. Taking the normal limits of total acidity as 40 to 60, we find values in hyperchlorhydria anywhere from 60 to 100 or even above. But it is not the total acidity alone that is diagnostic; one must know also the amount of free HCl, of combined HCl and of the organic acids and acid salts. Usually we find large amounts of free HCl present, making up the greatest part of the total acidity. But in some cases the free acid may be quite moderate, while the combined acid has the higher figure. What really settles the diagnosis and should always be looked upon as conclusive is the sum of the free and combined acid values, no matter which one of the two happens to be greater. If on the other hand it is found that with a high total acidity the greatest part of this is taken up by the organic acids and acid salts, the case is obviously not one of hyperchlorhydria.

Significance. The meaning of hyperchlorhydria is always the problem of most importance. It should be looked upon only as a symptom, and we have in every case to ask ourselves what condition underlies it. The possible conditions are not many, but to recognize the one operating in a given case is often extremely difficult.

(1) In many instances hyperchlorhydria is rightly classed as a *neurosis*; that is, there is no organic lesion found associated with it and the only explanation for it is in a disordered nervous system. Many facts speak for this as a common etiology. It occurs frequently in those who present other evidences of neurasthenia or hysteria. It is always worse after fits of emotion such as anger, or after periods of worry and anxiety or overwork. It is also suggestive that the degree of suffering is not always coincident with the degree of hyperacidity, for some patients with moderately high acidity complain constantly, while others with excessive amounts of free HCl on analysis may feel fairly well—showing that hyperesthesia or disordered sensation plays an important part in the production of symptoms. Even after a case is cured clinically and no further complaint is made, analysis may continue to show hyperacidity; but the element of hyperesthesia has been removed and so the hyperacidity is no longer perceived. Finally, a large proportion of the cases of hyperchlorhydria, diagnosed as nervous in origin because no other cause can be found, do undoubt-

edly recover promptly on treatment directed to the nervous system as well as to the stomach. Yet no greater error can be made in diagnosis than to assume too readily that hyperchlorhydria is merely a neurosis and that no organic disease exists. We are learning more and more to distrust all so-called gastric neuroses and to search each case carefully for some organic lesion, either in the stomach itself or possibly in some distant organ.

(2) The first organic lesion suspected when hyperchlorhydria is found is *gastric ulcer*. It is true that ulcer is almost inevitably accompanied by hyperchlorhydria; but there must be still other evidence to prove the existence of this most serious disease. The data upon which we depend for the conclusion that ulcer is present, are partly subjective and partly objective. In the history there is more definite localization of pain; the pain is more intense; it is frequently felt in the back as well as in the epigastrium; it is more likely to disturb sleep than is the burning distress of hyperchlorhydria; while a bloody vomitus is never present in simple hyperchlorhydria and does occasionally occur in ulcer—but should not be awaited before a diagnosis is reached. The objective evidence pointing to ulcer is not only the hyperchlorhydria found after a test meal, but the tender spots on pressure over the epigastrium; usually to the right of the median line, and over the back close to the 10th, 11th or 12th dorsal spine, usually to the left side of the vertebræ; the discovery of occult blood in the stomach contents or particularly in the feces; the finding of food retention in the stomach and of a left to right peristaltic wave, indicating obstruction at the pylorus, no matter whether this obstruction be due to actual mechanical or to simple spasmodic closure of its lumen. If the data are all positive, it is easy to conclude that the hyperchlorhydria is only one symptom of ulcer; but if the data are incomplete, it is often impossible to decide that the case is anything more than one of hyperchlorhydria. In such a case time, further observation and the effects of therapy help to settle the doubt. Regarding the value of orthoform in allaying the pain of ulcer, and thus as a diagnostic test, I have never had any results that justified confidence in it.

(3) Hyperchlorhydria is also found associated quite constantly with *duodenal ulcer*. In fact, there is practically no difference between this and gastric ulcer except the slight one of situation with reference to the pyloric orifice.³ The symptoms are much the same in both; but the points indicating that the ulcer lies on the duodenal side of the pylorus are the later occurrence of pain after food has been taken, the "hunger pain" especially at night when the stomach is empty, the lower situation of the tender spot in the epigastrium or right hypochondrium, and the fact that when hemorrhage occurs the blood is not vomited but passed by the bowel. Among objective signs, there is nothing about the degree of hyperchlorhydria to aid in determining the site of the ulcer; food retention in the stomach is as likely to occur whether the obstruction and spasm be just above the pylorus or just below it; but oc-

³ The writer's views on this point have changed decidedly during the months that have elapsed since this was written; and he now feels, at the time of publication, that this statement is not altogether correct.

cult blood in the feces without occult blood in the stomach contents is of some value in locating the ulcer below the pyloric orifice. The Einhorn duodenal bucket promises to be of aid in locating the site of the ulcer, but has so far not been tried in enough cases to make us sure of its value. In general it is much more easy to say that a hyperchlorhydria means ulcer in a given case, than it is to say which side of the pyloric ring the ulcer lies.

(4) One of the most important additions to our knowledge during the past decade has been the discovery that hyperchlorhydria may be associated with *gastric cancer*. This is true quite regularly when the cancer has developed on an ulcer base; and the frequency with which malignancy may follow chronic ulcer is becoming constantly better realized.* For years attention has been persistently called to the absence of hydrochloric acid from stomach contents in gastric cancer and this absence has been generally accepted as one of the vital points in the diagnosis. Now, however, we are learning that not only normal but even excessive amounts of acid may be found with cancer of the stomach, provided the cancer is a sequel to ulcer of the stomach. In a given case, therefore, hyperchlorhydria does not negative a possible diagnosis of cancer. In such a case after months of a history characteristic of gastric ulcer, there develop the loss of appetite, the coffee ground vomitus, the more constant diffuse pain, the rapid loss in weight, the cachexia and ultimately the palpable tumor mass characteristic of cancer. A valuable aid in diagnosis is that announced a few years ago by Schmidt, on examination of the stools. In either ulcer or cancer, occult blood may be found in the feces; but in cancer there may also be found in the feces numerous Oppler-Boas bacilli, Gram positive, while in ulcer these do not occur. This test has been proven of value in numerous cases by different observers, and helps to throw important light upon doubtful diagnosis between these two lesions.

(5) It must always be borne in mind that hyperchlorhydria may be associated with disease elsewhere in the digestive tract than in the stomach. The other organs particularly to be remembered for investigation are the gall-bladder and the appendix. In these conditions the gastric hypersecretion is only a nervous reflex. The difficulty is that to it all the symptoms are likely to be referred and the real trouble behind it is overlooked. In *gall-bladder disease* the symptoms may be almost entirely gastric for months—distress after food, eructations of gas, water-brash, nausea and occasional vomiting, and soreness and tenderness over the epigastrium or right hypochondrium; and when in addition hyperchlorhydria is found, the problem is considered solved. The data that point to the existence of disease outside the stomach are the occasionally recurring attacks of pain, more or less severe, in the gall-bladder region, regardless of diet and even while careful diet for hyperchlorhydria is being given; the slight elevation of temperature occurring with these attacks; the tenderness and rigidity found at the time at the lower border of the liver in the gall-

bladder area, and possibly a palpable mass there. There is no intention to convey the idea that gall-bladder disease is always accompanied by hyperchlorhydria; for on the contrary a normal acidity or subacidity is frequently found. But what is intended is to call attention to the fact that hyperchlorhydria, when it is found, may be simply the consequence of disease entirely outside the stomach, in the gall-bladder or elsewhere.

(6) As regards *the appendix*, chronic inflammation of this organ is a frequent source of dyspepsia of the acid type and after a test meal hyperchlorhydria is often found. It may be impossible in these cases of appendix dyspepsia to elicit any history of a previous acute attack of appendicitis; but there is usually definite evidence of trouble in the appendix region such as a palpable mass there with exquisite tenderness on deep pressure; and occasional attacks of pain and soreness, without fever or very severe suffering. Here again the hyperchlorhydria is only a symptom and not a constant symptom. Often with all the symptoms pointing to the stomach as the seat of disease, and with all of them such as are found with excessive acidity, the test meal shows hyperchlorhydria; and the cause of the gastric condition may not be suspected, until careful search reveals the appendix condition. Even then the relation of one to the other may not be considered proven until after ordinary treatment directed to the stomach has done no good. On the other hand, however, it must be remembered that the stomach may show normal acidity or even subacidity in chronic appendicitis and that appendix dyspepsia is not always of the acid type.

(7) Another symptom complex in which hyperchlorhydria is quite regularly found, is that associated with *movable kidney*. The combination of the symptoms of acid dyspepsia, chronic constipation, and general neurasthenia, is a frequent one with the objective findings not only those of hyperchlorhydria after a test meal, but also of a prolapsed right kidney. Frequently in these cases the stomach is also found prolapsed. It is often difficult to decide here just what should be the point of attack; but it is obvious after experience, if not before, that mere treatment of the gastric hypersecretion will not clear up the situation, and that the kidney prolapse must be dealt with by some method or other before success is achieved.

(8) Finally, hyperchlorhydria may mean chronic narrowing at the pylorus, with partial food retention and the irritation of the gastric mucous membrane that habitually results. Such chronic narrowing may be the consequence of the scar of a healed ulcer; or of adhesions from old gall-bladder inflammation; or of kinking from prolapse of the stomach. Evidences of this obstruction are the peristaltic wave to be elicited over the stomach; the delayed emptying of the organ and food stagnation proven to exist by the stomach tube; and the dilatation found by inflation. The previous history of the case must be relied upon to furnish the proof of former ulcer or cholecystitis; while inflation will demonstrate the existence of gastroptosis. The hyperacidity in these cases is again only a symptom, due directly to chronic irritation of the gastric

* Wilson & MacCarty: Am. Jour. Med. Sci., Dec., 1909, p. 846.

glands by too long retention of contents in the stomach; and indirectly to pyloric narrowing as a sequel of former organic disease.

Treatment. Granted that the hyperchlorhydria has been diagnosed as a gastric neurosis, associated with no organic lesion, much can be done to relieve it by medical means; and in any doubtful case, such treatment proves a diagnostic aid, by its success or failure. Of the first importance is *diet*; and after trials of various forms of foodstuffs, the proteids have been found to agree best, regardless of theoretical considerations to the contrary. The diet should therefore include milk, eggs and scraped meat, with thoroughly baked and partially dextrinized wheat bread. A list often prescribed at the outset is the following: 7 a. m., two soft-boiled or poached eggs; thoroughly toasted bread, or zwieback or toasted soda crackers, with butter; eight ounces of milk. 10 a. m., eight ounces of milk (with toast and butter if desired). 1 p. m., beef, mutton or chicken, picked into shreds while raw or chopped fine, then made into a meat ball and cooked rare; toast, zwieback or crackers with butter. 4 p. m., eight ounces of milk (with toast and butter if desired). 7 p. m., a bowlful of well cooked rice, with butter or cream; or shredded wheat biscuit with butter or cream; or toast or zwieback for variety; six ounces of milk to drink.

The fats are likewise of importance, because they not only are necessary to nutrition but because they decrease the acid secretion. Cream with the milk and butter on the zwieback or toast are therefore early additions to the dietary. Gradually other additions are made as the case improves, until at the end of a few weeks quite a liberal variety can be allowed; but always cautioning against all coarse and irritating foods. A diet list is furnished of articles permitted and denied, and the patient is advised to follow this carefully for weeks or months according to the progress of the case. Such a list usually allows eggs, tender meats, fish of any kind, milk, soups, thoroughly cooked cereals, crackers and zwieback; but excludes vegetables, fresh fruits and all acid and highly seasoned foods.

Next of importance in treatment come drugs. These aid by neutralizing the hyperacidity or by checking the secretion. For neutralizing the hyperacidity, a useful combination is one of soda bicarbonate and magnesia usta, to which powdered rhubarb is added if constipation exists; such a powder to be given an hour or two after meals, when gastric distress begins. Another useful powder is a combination of cerium exalate, bismuth subcarbonate and light carbonate of magnesia, given in the same way after food. Usually such powders can be gradually discontinued as the diet is made to combine with the excess of acid. In case of excessive nervous irritability sodium bromide can be added to either of the powders mentioned.

Of drugs that check secretion, the most valuable are belladonna, silver nitrate and olive oil. A pill of extract of belladonna and silver nitrate given before meals; or a half ounce or ounce of olive oil given in the same way are often very great aids in preventing distress. The former plan, alkalies after meals, is the one usually tried first. If symp-

toms do not disappear after a reasonable time, the second plan is then adopted, either alone or coincidentally.

In some cases with other outspoken evidences of neurosis besides the gastric condition, no results are obtained until the patient is taken from his usual activities, put to bed, isolated and given the usual regime known as the rest cure. In other cases it suffices to send such patients away from their usual business cares and family worries on a vacation, with the diet and prescriptions just described. By these various devices the patient with hyperchlorhydria can usually be made comfortable quickly and ultimately cured completely, so that he is at liberty to eat and live without such great restrictions; though the ailment is always likely to recur with indiscretions in diet or long-continued mental effort or worry or emotion.

If the case does not improve on any of the plans suggested, it can be assumed as reasonably certain that some cause exists not previously recognized. The first thought should be of an ulcer, for which further search should be made. Whether ulcer is positively discovered or seems only very probable, a systematic ulcer cure should next be instituted. There is a medical cure for gastric ulcer in its early stages; but for chronic ulcer, of several years' standing, where extensive organic changes have taken place, no permanent cure can be expected except from surgery. The danger that cancer may develop upon an open ulcer or upon the unhealthy cicatrix of a healed ulcer is still another argument for surgery in the chronic cases with persistent hyperchlorhydria. For hyperchlorhydria associated with movable kidney, much can sometimes be done by a properly fitting corset to support the kidney, in connection with diet and alkalies. For chronic appendicitis and chronic gall-bladder cases, no cure for the hyperchlorhydria exists except removal of the underlying cause; and the same is true for pyloric stenosis from whatever source it has arisen.

THE VALUE OF RECTAL EXAMINATIONS.*

By ALFRED J. ZOBEL, M. D., San Francisco.

A very brief description of the anatomical relations of the rectum and sigmoid colon will suffice to illustrate how functional or organic disturbance in neighboring parts might cause symptoms to arise in these portions of the large bowel, and vice versa; and at the same time demonstrate the necessity for, and the value of, rectal examinations.

The lower portion of the rectum is in relation anteriorly with the prostate gland and membranous urethra in men, and with the vagina in women. The upper portion is in relation anteriorly with the bladder and superior part of the prostate gland and the seminal vesicles in the male, and the vagina and the pouch of Douglas in the female. The latter contains the sigmoid flexure, loops of small in-

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